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L1 70267 S (VOLTAMMET? OR POTENTIOMET? OR POLAROGRAPHIC) (6A) (DETECT? OR
DETERMIN? OR MEASUR? OR MONITOR? OR ASSAY? OR ANALY? OR ASSES? OR TEST?
OR ESTIMAT? OR EVALUAT? OR EXAMIN? OR SENSE# OR SENSING OR SENSOR OR
PROBE# OR PROBING OR QUANTITAT? OR QUANTIF?)
L2 39 S L1 AND TONGUE
L3 1032 S L1 AND WORKING(2A) (ELECTRODE OR MICROELECTRODE)
L4 6055 S L1 AND(PULSE# OR PULSING)
L5 2 S L1 AND(SAPV OR LAPV OR SUPERLAPV)
L6 12 S SAPV OR LAPV OR SUPERLAPV
L7 211 S L1 AND(MULTIVARIATE OR PLC OR PLS OR ODP OR OPTIMAL DISCRIM? OR
PRINCIPAL COMPONENT OR PARTIAL LEAST)
L8 745 S L1 AND (UREA OR CHOLESTEROL OR CREATININE)
L9 100 S L4 AND L7-8
L10 8 S L1 AND WORKING(2A) (ELECTRODE OR MICROELECTRODE) (5A) (PLURAL? OR
MULTIPLE OR ARRAY)
L11 193 S L3 AND L4
L12 15 S L11 AND (ALTERNAT? OR(POSITIV? AND NEGATIV?)OR(SELECT? OR
CHOOS?) (6A) (PULSE# OR PULSING) (4A) (POTENTIAL OR SEQUENCE OR PROGRAM OR
PATTERN))
L13 178 S L11 NOT L12
L14 144 S L13 NOT GLASSY
L15 32 S L14 AND (TRACE OR BLOOD OR URINE)
L16 193 S L2,L6,L9-10,L12,L15
L17 160 S L16 NOT PY>2001
L18 7 S L16 NOT L17 AND PATENT/DT
L19 167 S L17-18

=> d bib,ab 119 1-167

L118 ANSWER 7 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 137:72203 CA
TI Electronic **tongue** as ozone detector
IN Winqvist, Fredrik; Hoegberg, Carina; Kranz-Rueckler, Christina; Ekberg,
Kjell
PA Otre AB, Swed.
SO PCT Int. Appl., 48 pp.
PI WO 2002052254 A1 20020704 WO 2001-SE2848 20011220
US 2002157946 A1 20021031 US 2001-28485 20011220
PRAI EP 2000-128297 A 20001222
AB This electronic **tongue** for the detection and detn. of ozone in a liq. is
based on voltammetry, and has at least one working electrode and a counter
electrode. The working electrode(s) is(are) made of one or more transition
metals or Au, or alloys thereof, or alloys thereof with other metals. The
data processing includes multivariate anal. techniques. The sensor can be
implemented online or in-line in a processing plant where it is desirable to
monitor and control ozone levels, e.g. sterilization and purifn. plants.
L19 ANSWER 16 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 136:174428 CA
TI Exemplifying performance of kinetics-sensitive double-step volt coulometry:
redox reactions of protons in unsupported acids
AU Thurzo, I.; Gmucova, K.; Orlicky, J.; Pavlasek, J.
CS Institute of Physics, Slovak Academy of Sciences, Bratislava, 842 28,
Slovakia

SO Journal of Electroanalytical Chemistry (2001), 514(1-2), 26-34
AB An **alternative** electroanal. technique to the widely used differential **pulse voltammetry** (DPV) is presented in connection with **monitoring** proton redox reactions in strong acids (HCl, H₂SO₄, HNO₃) and in l-ascorbic acid (AA) in the absence of any supporting electrolyte. Contrary to the DPV method, the current flowing through the **working electrode** in response to a double-step change of the applied potential is first integrated and subsequently processed by a three-channel correlator. Expressing the faradaic transient charge as $Q(t) \approx t\beta$, the ratio $R\beta = [Q(t_1) - 2Q(5t_1) + Q(9t_1)] / (I_{lim}t_1)$, where t_1 is the delay of the first sampling event with respect to the trailing edge of the potential double step and I_{lim} is the limiting current of the corresponding steady-state voltammetric wave, it is calcd. and then compared to the values found exptl. The sensitivity to the kinetics represented as $dR\beta/d\beta$ has an optimum around $\beta=0.5$, a value consistent with the Cottrell equation. The exptl. data point to a crucial role of CO₂ (H₂CO₃) dissolved in the acid soln., envisaged as the reversed sign of the measured charge. After deaerating the soln. by argon the sign became **pos.**, nevertheless the exptl. $R\beta$ values were systematically higher than the predicted ones. The reaction of the protons of AA at **neg.** potentials seems to be of the EC type when proceeding from **neg.** to more **pos.** potentials. Moreover, there is a dominant voltammetric wave of AA at **pos.** potentials coming from an irreversible reaction, accompanied by a relatively weak peak of the correlated charge.

L19 ANSWER 18 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 136:128193 CA
TI Capability of discrimination: application to soft calibration methods
AU Sanz, M. B.; Sarabia, L. A.; Herrero, A.; Ortiz, M. C.
CS Faculty of Sciences, Department of Chemistry, University of Burgos, Burgos, 09001, Spain
SO Analytica Chimica Acta (2001), 446(1-2), 297-311
AB Given a nominal concn., to know the behavior of an anal. procedure in samples with similar concns., the min. discriminable concn. is defined as the smallest concn. of the analyte in a sample which can be distinguished, with probability $1-\beta$, from the nominal value. This definition generalizes the concept of min. detectable net concn. established by ISO norm 11843 which is restricted to the case in which the nominal concn. is zero. Given an anal. procedure with a well-established net detectable concn. (detection limit), it may not be possible to discriminate this same concn. when the procedure was used in samples with a much higher nominal concn. For this reason, the discrimination capability is a criterion for the selection of an anal. procedure when it is going to be used to det. concns. well above its detection limit. The discrimination capability is established as a hypothesis test based on the data of a calibration carried out in a range of concns. which contains the nominal value. As an application, the discrimination capability was estd. when the concn. of a sample test was obtained by a **partial least squares** (PLS) calibration. In this case, the proposed procedure is composed of three steps, the 1st of which consists of the soft **multivariate** calibration. The 2nd step is the evaluation of the discrimination capability by a regression of the concn. found with the **multivariate** calibration vs. the true concn. of a new set of ref. samples. The std. deviation of the regression ests. the repeatability (anal. procedure and soft calibration jointly) at the concn. range analyzed in the regression. In the 3rd step, the capability of discrimination calcd. is applied to a new test sample if the repeatability has not changed at the level of concn. considered. The procedure developed was applied to the **detn.** of benzaldehyde by differential **pulse polarog.** (DPP), where univariate calibration cannot be applied and a PLS calibration is appropriate. The

capability of discrimination was evaluated at two different concn. ranges: from 0.10 to 1.05 μM , and from 0.0199 to 0.1740 mM, with an estd. repeatability of $3.1 \times 10^{-2} \mu\text{M}$ and $3.2 \times 10^{-3} \text{mM}$, resp. The DPP+PLS capability of discrimination performance is analyzed by the false noncompliance and the false compliance probability in the case that the anal. method has to discriminate differences <10% of the nominal concn. with sufficient warranty.

L19 ANSWER 19 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 136:111852 CA

TI Comparison of a voltammetric electronic **tongue** and a lipid membrane taste sensor

AU Ivarsson, Patrik; Kikkawa, Yukiko; Winqvist, Fredrik; Krantz-Rulcker, Christina; Hojer, Nils-Erik; Hayashi, Kenshi; Toko, Kioshi; Lundstrom, Ingemar

CS Linköping University, S-SENCE (Swedish Sensor Centre) and Laboratory of Applied Physics, Linköping, SE-581 83, Swed.

SO Analytica Chimica Acta (2001), 449(1-2), 59-68

AB An electronic **tongue** based on **voltammetry** and a multichannel lipid membrane taste **sensor** based on **potentiometry** are compared using two aq. examples: detergents and teas. The electronic **tongue** consists of four electrodes of different metals, a ref. electrode and a counter electrode. The **measurement principle** is based on **pulse voltammetry** in which current is **measured** during the change of the amplitude of the applied potential. The taste sensor is based on eight different lipid/polymer membranes. The voltage difference between the electrodes and an Ag/AgCl ref. electrode is measured when the current is close to zero. The responses from the two sensors systems are treated sep. with **multivariate** data anal. based on **principal component** anal. and then merged to examine if further information could be extd. Although the two sensor systems are about equal in sepn. ability in the two cases, extra information can be gained by combination of the two sensor systems.

L19 ANSWER 26 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 135:216678 CA

TI Soft modelling approach applied to voltammetric data: study of electrochemically labile metal-glycine complexes

AU Fernandez, M.; Arino, C.; Diaz-Cruz, J. M.; Tauler, R.; Esteban, M.

CS Instituto de Materiales y Reactivos, Universidad de la Habana, Ciudad de la Habana, Cuba

SO Journal of Electroanalytical Chemistry (2001), 505(1-2), 44-53

AB The systems Cd^{2+} -glycine and Pb^{2+} -glycine, which form successive electrochem. labile complexes, were studied by several polarog. techniques: differential **pulse**, normal **pulse** and reverse **pulse** polarog. The **voltammetric** data were **analyzed** by both the classical DeFord-Hume method (a hard modeling approach) and by a **multivariate** curve resoln. method based on different factor anal. techniques (a soft modeling approach). The results have been compared with each other and also with those from the literature. It was found that while for labile complexes the necessary (for factor anal. techniques) condition of linearity of the current with respect to the concns. is not always completely fulfilled, the results obtained by the two approaches are very similar. This suggests that for these systems the fraction of non-linearity of the signals is small and can be neglected. Thus, the proposed soft modeling approach also provided good estns. of the complexation parameters, and is suitable for use as a complementary tool on the study of systems with successive labile complexes.

L19 ANSWER 28 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 135:210034 CA

TI Discrimination of tea by means of a voltammetric electronic **tongue** and different applied waveforms
AU Ivarsson, P.; Holmin, S.; Hojer, N.-E.; Krantz-Rulcker, C.; Winqvist, F.
CS Askö Cylinda AB, Vara, SE-534 82, Swed.
SO Sensors and Actuators, B: Chemical (2001), B76(1-3), 449-454
AB A new **sensor** technol., an electronic **tongue** based on **voltammetry** has been developed at Linköping University. Three different metallic working electrodes are used in combination with a set of voltage "**pulses**", a waveform, to sep. different samples. Three different waveforms were investigated. This is done through a study with 9 different teas. **Multivariate** data anal. (MVDA) and **principal component** anal. (PCA) were used to evaluate the data (the recorded current responses). The waveforms were large amplitude **pulse** voltammetry (LAPV), small amplitude **pulse** voltammetry (SAPV), and staircase voltammetry. Each method discriminated between the tea samples to some extent, but differently from each other. Best discrimination is achieved when the combination LAPV and staircase are merged together. When SAPV is included in the combination a worse sepn. is obsd. It is clearly the case that more waveforms do not automatically lead to more information.

L19 ANSWER 34 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 134:135647 CA

TI Electronic **tongues** for environmental monitoring based on sensor arrays and pattern recognition: a review

AU Krantz-Rulcker, C.; Stenberg, M.; Winqvist, F.; Lundstrom, I.

CS Division of Applied Physics and Swedish Sensor Centre (S-SENCE), Linköpings Universitet, Linköping, SE-581 83, Swed.

SO Analytica Chimica Acta (2001), 426(2), 217-226

AB *Advis* A review with 49 refs. concerning the use of elec. **tongues** and taste sensors and sensor arrays and pattern recognition applied to obtained signal patterns for environmental monitoring is given. Topics discussed include: elec. **tongue** principles (general overview, multivariate anal., **potentiometric** devices, **voltammetric sensor** arrays, other devices); environmental **monitoring**; and drinking water monitoring (background, water prodn. process description, samples and measurement procedure, principal component anal. plots of water samples).

L19 ANSWER 35 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 134:36522 CA

TI A chemometric analysis of dual **pulse** staircase voltammograms obtained in mixtures of ethanol, fructose and glucose

AU Bessant, C.; Saini, S.

CS Institute BioScience & Technology, Cranfield Centre for Analytical Science, Cranfield University, Silsoe, Bedfordshire, MK45 4DT, UK

SO Journal of Electroanalytical Chemistry (2000), 489(1,2), 76-83

AB *Advis* In a previous paper we reported that by using artificial neural networks (ANNs) to interpret data acquired using dual **pulse** staircase **voltammetry** (DPSV), it is possible to det. the concns. of aliph. compds. in mixts. This paper extends that work by probing the relationship between the DPSV response and mixt. compn. by fitting the acquired data to a proposed model, using a method based on multiple linear regression (MLR) and anal. of variance (ANOVA). The results of this suggest that the system is predominantly a linear function of the analyte concns., with addnl. contributions from a non-linear ethanol term and a fructose-ethanol interaction term. The common **multivariate** calibration techniques of MLR, **principal component** regression (PCR) and linear and non-linear **partial least squares** (PLS) were subsequently evaluated for the calibration of DPSV voltammograms. These approaches are compared with the previously published

artificial neural network (ANN) results. ANNs are found to give the lowest prediction errors, although PLS and PCR are only slightly worse - this is assumed to be due to their inability to model the fructose-ethanol interaction and non-linearity of the ethanol response.

L19 ANSWER 37 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 133:343836 CA
TI Non-specific sensing materials for "electronic tongue": Cross-sensitivity evaluation
AU Legin, A. V.; Rudnitskaya, A. M.; Lvova, L. B.; Vlasov, Yu. G.
CS Chemistry Department, St. Petersburg University, St. Petersburg, 199034, Russia
SO Chemical Sensors, Technical Digest of the International Meeting, 7th, Beijing, China, July 27-30, 1998 (1998), 713-715 Publisher: International Academic Publishers, Beijing, Peop. Rep. China.
AB The development of new promising field of sensor application - multisensor arrays for liq. anal. based on the principles of electronic tongue implies some new demands on sensor material R and D. The stable and reproducible sensors with partial specificity and considerable cross-sensitivities to different components in solns. are of primary interest. The present paper deals with application of a method of cross-sensitivity estn. that the authors suggested earlier to potentiometric chem. sensors with PVC membrane. Cross-sensitivity to alkali and alkali-earth cations were evaluated.

L19 ANSWER 38 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 133:316875 CA
TI «Electronic tongue» - new analytical tool for liquid analysis on the basis of non-specific sensors and methods of pattern recognition
AU Vlasov, Yu. G.; Legin, A. V.; Rudnitskaya, A. M.; D'Amico, A.; Di Natale, C.
CS Chemistry Department, St. Petersburg University, St. Petersburg, 199034, Russia
SO Chemical Sensors, Technical Digest of the International Meeting, 7th, Beijing, China, July 27-30, 1998 (1998), 229-231 Publisher: International Academic Publishers, Beijing, Peop. Rep. China.
AB Development of promising sensor instrument - electronic tongue based on sensor arrays with data processing by pattern recognition methods were described. The attention is paid to electronic tongue based on an array of original nonspecific (nonselective) potentiometric chem. sensors with chalcogenide glass membranes. Principles of research, criteria for the development of nonselective sensing materials, pattern recognition methods were described. Possible applications and some results of integral qual. anal. of beverages and of quant. anal. of complex liqs., contg. heavy metals are reported. Discriminating power obtained and possibility of multicomponent anal. permit to consider electronic tongue as a perspective anal. concept.

L19 ANSWER 41 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 133:190060 CA
TI Multiplexing of microelectrode arrays in voltammetric measurements
AU Hintsche, Rainer; Albers, Jorg; Bernt, Helmut; Eder, Alfred
CS Fraunhofer-Institut fur Siliziumtechnologie, Itzehoe, D-25524, Germany
SO Electroanalysis (2000), 12(9), 660-665
AB Multipotentiostats are the equipment commonly used for voltammetric measurements with multichannel electrode arrays, because the conditioning of the working electrodes does not allow fast multiplexing for measuring current responses. In this article, multiplexing and serial read-out of electrode arrays using a simple potentiostat and integrated circuits are shown. Several specially constructed switches, which were integrated in an

application specific integrated circuit (ASIC) in complementary metal oxide semiconductor (CMOS) technol., allow electrode potentials to be applied as if by a potentiostat during the read-out time as well as continuously applying a bias voltage during stand-by. The application of multiplexing and serial read-out is demonstrated by redox recycling of p-aminophenol in an interdigitated microelectrode array made in silicon technol. Here, a bipotentiostat generates two different potentials that are addressed by the ASIC to the anodes and cathodes for redox recycling. The results show the same quality as those using a multipotentiostat.

L19 ANSWER 42 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 133:129264 CA

TI 'Electronic **tongue**' - new analytical tool for liquid analysis on the basis of non-specific sensors and methods of pattern recognition

AU Vlasov, Y. G.; Legin, A. V.; Rudnitskaya, A. M.; D'Amico, A.; Di Natale, C.
CS Chemistry Department, St. Petersburg University, St. Petersburg, 199034, Russia

SO Sensors and Actuators, B: Chemical (2000), B65(1-3), 235-236

AB Development of promising sensor instrument - electronic **tongue** based on sensor arrays with data processing by pattern recognition methods were described. The attention is paid to electronic **tongue** based on an array of original nonspecific (nonselective) **potentiometric** chem. **sensors** with chalcogenide glass membranes. Principles of research, criteria for the development of nonselective sensing materials, pattern recognition methods were described. Possible applications and some results of integral qual. anal. of beverages and of quant. anal. of complex liqs., contg. heavy metals are reported. Discriminating power obtained and possibility of multicomponent anal. permit to consider electronic **tongue** as a perspective anal. concept.

L19 ANSWER 45 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 132:353953 CA

TI Development of an electronic **tongue** based on **potentiometric sensors**

AU Mazzone, E.; Di Natale, C.; Mantini, A.; D'Amico, A.; Legin, A.;
Rudnitskaya, A.; Vlasov, Yu.

CS Department of Electronic Engineering, University of Rome "Tor Vergata", Rome, 00133, Italy

SO Sensors and Microsystems, Proceedings of the Italian Conference, 4th, Roma, Feb. 3-5, 1999 (2000), Meeting Date 1999, 282-287. Editor(s): Di Natale, Corrado; D'Amico, Arnaldo; Davide, Fabrizio. Publisher: World Scientific Publishing Co. Pte. Ltd., Singapore, Singapore.

AB In the frame of a joint research between the University of Rome "Tor Vergata" (Sensors and Microsystems group), and the Labs. of Chem. Sensors of the University of St. Petersburg, an Electronic **Tongue** has been designed, constructed and applied to qual. anal. of different kinds of complex liqs., such as mineral waters, wines and biol. samples. The results presented in this paper show that the electronic **tongue** can give interesting information in various applications of fundamental interest (i.e. drinkable water control, food industry and medicine).

L19 ANSWER 49 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 132:270888 CA

TI Electrochemical pretreatment of polycrystalline gold electrodes to produce a reproducible surface roughness for self-assembly. A study in phosphate buffer pH 7.4

AU Hoogvliet, J. C.; Dijksma, M.; Kamp, B.; Van Bennekom, W. P.

CS Department of Pharmaceutical Analysis and Human Toxicology Faculty of Pharmacy, Utrecht University, Utrecht, 3508 TB, Neth.

SO Analytical Chemistry (2000), 72(9), 2016-2021
AB It was emphasized in several studies that the state of the surface, including the surface roughness, is very important for the reproducible formation of high-quality self-assembled monolayers on Au. The **pulsed-potential pretreatment** procedure described in this paper can, in a reproducible way, reduce the surface roughness of mech. polished polycryst. Au electrodes by a factor 2. The developed procedure, in which the Au is **alternately** oxidized and reduced, was optimized for use in a flow system (100 mM phosphate buffer pH 7.4). The influence of the pretreatment procedure on the surface roughness of the electrodes was studied by in-situ oxygen adsorption **measurements** using **cyclic voltammetry**. The most effective **pulse** regime in producing a Au surface with a reproducible and relatively low surface roughness is a triple-potential **pulse** waveform, with potentials of +1.6, 0.0, and -0.8 V vs SCE and **pulse** widths of 100 ms for each potential. Prolonged **pulsing** for 2000-5000 s with the Au **working electrode** in a flow-through cell showed an electropolishing effect, i.e., a decrease of the roughness in time. Flow conditions are very important: the roughness decreased faster at higher flow rates, while an increase was obsd. without flow. A process of reconstruction and dissoln. of Au during application of the potential **pulses** under flow conditions is assumed to account for the obsd. phenomena. A self-assembled monolayer of thiocetic acid with reproducible characteristics, detd. with impedance measurements, could be formed on a pretreated Au surface.

L19 ANSWER 50 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 132:264296 CA
TI A hybrid electronic **tongue**
AU Winquist, F.; Holmin, S.; Krantz-Rulcker, C.; Wide, P.; Lundstrom, I.
CS The Swedish Sensor Centre, Department of Physics and Measurement Technology, Linkoping University, Linkoping, S-581 83, Swed.
SO Analytica Chimica Acta (2000), 406(2), 147-157
AB A hybrid electronic **tongue** is described based on a combination of potentiometry, voltammetry and cond. It was used for classification of six different types of fermented milk. Using ion-selective electrodes, pH, carbon dioxide and chloride ion concns. were measured. The voltammetric electronic **tongue** consisted of six working electrodes of different metals (gold, iridium, palladium, platinum, rhenium and rhodium) and an Ag/AgCl ref. electrode. The **measurement** principle is based on **pulse voltammetry** in which current transients are **measured** due to the onset of voltage **pulses** at decreasing potentials. The data obtained from the measurements were treated by **multivariate** data processing based on **principal components** anal. and an artificial neural net. The hybrid **tongue** could sep. all six samples. Also, the nature of the microorganisms in the different fermns. was reflected in the **principal component** anal.

L19 ANSWER 52 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 132:116857 CA
TI Determination of amines by capillary electrophoresis using a **pulse voltammetric detector**
AU Wang, Li-Shi; Yang, Xiao-Yun; Mo, Jin-Yuan
CS Dep. Applied Chem., South China Univ. Technology, Canton, 510641, Peop. Rep. China
SO Gaodeng Xuexiao Huaxue Xuebao (2000), 21(1), 56-58
LA Chinese
AB The detn. of five arom. amines was studied by capillary electrophoresis using **pulse voltammetric detector**. The D/A converter at an EVOC PLC-711B Card was used to generate the **pulse** electrode potential waveform. The A/D converter acquired the electrode current at the last one millisecond of

every pulse. Good reproducibility and low limit were obtained. **Pulse voltammetric detection** has the advantages of elimination of charge current and direct identification of unknown chems.

L19 ANSWER 58 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 131:169480 CA
TI Application of electronic **tongue** for quantitative analysis of mineral water and wine
AU Legin, Andrey; Rudnitskaya, Alisa; Vlasov, Yuri; Di Natale, Corrado; Mazzone, Emiliano; D'Amico, Arnaldo
CS Chemistry Dep., St. Petersburg Univ., St. Petersburg, 199034, Russia
SO Electroanalysis (1999), 11(10-11), 814-820
AB An electronic **tongue** comprising 29 **potentiometric** chem. **sensors** and pattern recognition tools for the data processing was applied for the anal. of Italian produced mineral waters and dry red wines. The electronic **tongue** was able to distinguish between different sorts of mineral waters, between org. matter-contaminated waters and pure ones, and between Barbera wine samples of the same denomination but from different vineyards. Simultaneously with qual. recognition, quant. detn. of some components in the water and the wine was performed. The electronic **tongue** can be highly valuable in food quality control.

L19 ANSWER 65 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 130:124017 CA
TI Monitoring of freshness of milk by an electronic **tongue** on the basis of voltammetry
AU Winqvist, F.; Krantz-Rulcker, C.; Wide, P.; Lundstrom, I.
CS The Swedish Sensor Centre and the Laboratory of Applied Physics, Linkoping University, Linkoping, S-581 83, Swed.
SO Measurement Science and Technology (1998), 9(12), 1937-1946
AB We describe an electronic **tongue** which consists of a ref. electrode, an auxiliary electrode and five wires of different metals (gold, iridium, palladium, platinum and rhodium) as working electrodes. The **measurement** principle is based on **pulsed voltammetry**, in which successive voltage **pulses** of gradually changing amplitudes are applied to the working electrodes connected in a std. three-electrode configuration. The five working electrodes were successively connected and corresponding current-response transients are recorded. The electronic **tongue** was used to follow the deterioration of the quality of milk due to microbial growth when milk is stored at room temp. The data obtained were treated with **principal component** anal. and the deterioration process could clearly be followed in the diagrams. To make models for predictions, projections to latent structure and artificial neural networks were used. When they had been trained, both models could satisfactorily predict the course of bacterial growth in the milk samples.

L19 ANSWER 76 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 128:187934 CA
TI Cross-sensitivity evaluation of chemical sensors for electronic **tongue**: determination of heavy metal ions
AU Vlasov, Yuri; Legin, Andrey; Rudnitskaya, Alisa
CS Chemistry Dep., St. Petersburg University, St. Petersburg, 199034, Russia
SO Sensors and Actuators, B: Chemical (1997), B44(1-3), 532-537
AB The development of the promising new field of sensor applications, multisensor arrays for liq. anal. based on the principles of the electronic **tongue**, implies some new demands on sensor material research and development. Stable and reproducible sensors with partial specificity and considerable cross-sensitivities to different components in solns. are of

primary interest. Solid-state potentiometric sensors, both cryst. and vitreous, probably are the most promising ones for multisensor devices designed for long-term anal. application in natural and artificial complex media. The present paper deals with development of a method of evaluation of integral heavy metal cation sensitivity of solid-state sensors with special consideration of cross-sensitivity features. The methods involves a comparative study of different sensor materials in individual component solns., using several criteria based on integral response parameters. The procedure scheme can be applied to evaluate cross-sensitivity of any kind of potentiometric sensors for liq. media.

L19 ANSWER 80 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 128:101244 CA

TI An electronic tongue based on voltammetry

AU Winquist, Fredrik; Wide, Peter; Lundstrom, Ingemar

CS S-SENCE (Swedish Sensor Center) and the Laboratory of Applied Physics, Linkoping University, S-581 83 Linkoping, Swed.

SO Analytica Chimica Acta (1997), 357(1-2), 21-31

AB Presently, great interest is shown in the concept of an electronic nose. It consists of an array of gas sensors with different selectivity patterns, a signal collecting unit and pattern recognition software applied to a computer. Similar concepts, but for anal. in liqs. have also been described, and since they are related to the tasting sense, the term 'electronic tongue' or 'taste sensor' was coined. This paper describes how various voltammetric techniques such as large and small amplitude pulse voltammetry can generate information when combined with a multivariate anal. method. A prototype of an electronic tongue was designed, based on the combination of voltammetry, using a double working electrode of gold and platinum, and principal component anal. It is demonstrated how this electronic tongue is able to classify various samples such as fruit juices, still drinks and milk. It was also possible to follow aging processes of milk and orange juice when stored at room temp.

L19 ANSWER 85 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 126:309304 CA

TI Application of multivariate curve resolution to the voltammetric data. Factor analysis ambiguities in the study of weak consecutive complexation of metal ion with ligand

AU Grabaric, Bozidar S.; Grabaric, Zorana; Tauler, Roma; Esteban, Miquel; Casassas, Enric

CS Department of Analytical Chemistry, University of Barcelona, Av. Diagonal 647, Barcelona, E-08028, Spain

SO Analytica Chimica Acta (1997), 341(2-3), 105-120

AB Different techniques for factor anal. (FA) were applied in the study of weak consecutive complexes of Cd(II) propanoate by analyzing exptl. matrixes obtained from 4 electroanal. techniques: normal pulse polarog. (NPP), reverse normal pulse polarog. (RNPP), differential pulse polarog. (DPP) and differential pulse anodic stripping voltammetry (DPASV). All expts. were performed at a const. temp., $25 \pm 1^\circ$, in aq. solns. having a const. Cd ion concn. (10 and $20 \mu\text{M}$), varying propanoate concns. in the range 10-400 mM, a const. c(propanoic acid)-to-c(sodium propanoate) ratio (1:50), and a const. ionic strength (2M), obtained by addn. of NaClO_4 . From the exptl. signals by using DeFord and the Hume's model, to calc. the exptl. F0 function model identification, β_i ests. and corresponding std. error of stability consts. were obtained by using conventional fitting of polynomial (univariate hard modeling) to the exptl. data, together with the recently proposed evolving polynomial fitting and optimized least squares extrapolation of F_i functions. The same exptl. data matrixes were analyzed by multivariate soft

modeling approach by using the following FA techniques: **principal component anal. (PCA)**, evolving factor anal. (EFA) and constrained alternating least squares (ALS) optimization of individual and global (augmented) data matrixes.

L19 ANSWER 88 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 126:180454 CA
TI Design of an intelligent electrochemical system using cybernetic instrumentation
AU Oduoza, C. F.; Fielden, P. R.; Miller, R. M.
CS School of Engineering, University of Exeter, North Park Road, Exeter, EX4 4QF, UK
SO Chemometrics and Intelligent Laboratory Systems (1996), 32(2-3), 71-85
AB A computer-controlled intelligent electroanal. system capable of self optimization, and completely independent of operator control was designed and constructed. The system incorporates a supervisory program, the Simplex optimization method, a **multivariate** search technique which applies a set of rules to guide, and thereby generate optimal results in voltammetric expts. Math. representations of waveforms common in electroanal. were derived and fitted in real time to exptl. data using the relevant response parameters, and the results obtained were validated within confidence limits.

L19 ANSWER 89 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 126:83728 CA
TI **Voltammetric multichannel measurements** using silicon fabricated microelectrode arrays
AU Paeschke, Manfred; Dietrich, Frank; Uhlig, Albrecht; Hintsche, Rainer
CS Fraunhofer Inst. Silicon Technol., Berlin, D-14199, Germany
SO Electroanalysis (1996), 8(10), 891-898
AB A modular **voltammetric multichannel detection** system was developed for use in flow anal. 2 Different types of multichannel potentiostats, an adjustable and a ground-fixed potentiostat, were realized. Both types worked with ≤ 16 independent **working electrodes** at 1 chip electrode array and were controlled through a personal computer and a microcontroller. Simultaneous difference pulse and cyclic voltammetric procedures were realized. Pt thin-film array electrodes were arranged on Si wafers as pairs of interdigitated microband electrodes (interdigitated array electrodes; IDA) with an interelectrode gap in the submicrometer range. Furthermore, the multichannel electrodes in a flow system were used to characterize the highly sensitive flow profiles and flow rate measurements using redox mediators. A brief description of applying multichannel device for "window" stripping of heavy metals was given.

L19 ANSWER 92 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 125:184285 CA
TI Simultaneous determination of metals at **trace** level in a multicomponent system. Application to real samples
AU Locatelli, C.; Torsi, G.
CS Dep. of Chemistry, Univ. of Bologna, Bologna, I-40126, Italy
SO Electrochimica Acta (1996), 41(13), 2011-2017
AB Voltammetry is a very suitable, versatile and rapid method for the simultaneous metal detn. in complex matrixes. The present work, regarding the detn. of Cu, Fe, Cr, Sn, Ti, Mo and Mn, is a very interesting example of the possibility to det. single elements in real samples. 0.1 M ammonium citrate (pH 6.1 and 8.5) was employed as the supporting electrolytes. Differential **pulse voltammetric (DPV)** and a.c. **voltammetric (ACV)** **measurements** were carried out using, as **working electrode**, a stationary mercury electrode, as auxiliary a platinum electrode and as ref. an Ag/AgCl,

TP250.55
main mic

KCl sat. electrode. The anal. procedure was verified by the anal. of std. ref. materials such as Stainless Steel (AISI 321) NBS-SRM 121d1 and Highly Alloyed Steel Eurostandard 281-1a. Precision and accuracy, expressed as relative std. deviation and relative error, resp., were of the order of 3-5%, while the detection limit for each element was $\sim 10^{-9}$ M. The std. addn. technique extends the usefulness of the voltammetric method to very high element concn. ratios.

L19 ANSWER 96 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 124:218850 CA

TI Determination of metals in a multicomponent system by differential pulse and alternating current anodic stripping voltammetry

AU Locatelli, Clinio; Vasca, Ermanno; Bighi, Corrado; Fagioli, Francesco; Garai, Tibor

CS Dep. Chem., Univ. Salerno, Salerno, I-84081, Italy

SO Electroanalysis (1996), 8(2), 165-70

AB A combination of sensitive and selective voltammetric methods, differential pulse (DPASV) and fundamental and 2nd harmonic a.c. anodic stripping voltammetry (ACASV) are very suitable techniques for the simultaneous detn. of metal species having half-wave potentials close to one another. The simultaneous detn. of traces of CuII, BiIII, SbIII, PbII, CdII and SnII is described using 0.1M HCl as the supporting electrolyte with the subsequent addn. of 0.02M EDTA or 1.0M NaOH (for the anal. of CuII, SbIII and SnII, resp.). A semi-stationary Hg electrode (long lasting sessile drop Hg electrode) was used as the **working electrode**. A SCE and a Pt electrode were used as the ref. and auxiliary electrodes, resp. The anal. procedure was verified with the anal. of std. ref. material NBS-SRM 631 Spectrog. Zn Spelter LV1. Precision and accuracy, expressed as relative std. deviation and relative error, resp., were 3 to 5%, while the detection limits were of the order of 10^{-8} to 10^{-10} M in the case of element examd.

L19 ANSWER 112 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 120:132500 CA

TI Interest of **pulsed** electrochemical detection for the analysis of flavor-active alcohols separated by liquid chromatography

AU Le Fur, Elisabeth; Etievant, Patrick X.; Meunier, Jean Marie

CS Lab. Recherche Aromes, INRA, Dijon, 21034, Fr.

SO Journal of Agricultural and Food Chemistry (1994), 42(2), 320-6

AB Electrochem. detection of short-chain aliph. alcs. sepd. by liq. chromatog. demonstrates close sensitivities at gold and platinum **working electrodes**. Addn. of acetonitrile in the eluent decreases the sensitivity of detection (peak area) at the gold electrode but improves the apparent sensitivity (peak height) by a consequent decrease of retention time. At the platinum electrode, the detection was completely inhibited by **traces** of acetonitrile. Gold was therefore chosen to investigate the amperometric detection of flavor-active alcs., and particularly of terpenols, sepd. by reversed-phase chromatog. using an acetonitrile-water (1:1) eluent. Primary alcs. were detected at the ppb level (20-300 ppb) and secondary and tertiary alcs. at the ppm level (0.1-6 ppm). Primary and secondary alcs. can be quantified with good repeatability and sensitivity in a wide range of concns. Unsatn. in the alcs. drastically improves the limits of detection due to a better adsorption at the electrode surface. Tertiary alcs. can be easily detected at 2 different optimum potentials, but are more difficult to quantify accurately.

L19 ANSWER 113 OF 167 CA COPYRIGHT 2003 ACS on STN

AN 120:3732 CA

TI Amperometric ion sensors and their applications in food chemistry and

clinical chemistry

AU Senda, Mitsugi; Yamamoto, Yukitaka
CS Dep. Biosci., Fukui Prefect. Univ., Fukui, 910-11, Japan
SO Bioelectroanal., 2, Symp., 2nd (1993), Meeting Date 1992, 139-60. Editor(s):
Pungor, Erno. Publisher: Akad, Kiado, Budapest, Hung.
AB Amperometric ion **sensors** based on amperometry or **voltammetry** with a polarizable oil/water interface are described and discussed for their applicability in anal. of foods and body fluids. The amperometric sensor gives a current response proportional to the concn. of the analyte. The **pulsed** amperometric technique is used to follow the current response of the sensors, which allows the sensors high reproducibility and long lifetime. In amperometry or **voltammetry**, simultaneous **detn.** of two or more **analytes** with a single sensor can be achieved. Also, correction for (residual) current due to interfering (residual) substance(s) is relatively easy. Amperometric sensors for the detn. of K and Na ions and of volatile amines (ammonia and trimethylamine) in foods are described. A biosensor for **urea** and its applicability to body fluid anal. are presented. A **creatinine** biosensor also is described.

L19 ANSWER 115 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 119:240845 CA
TI Cathodic stripping **voltammetric determination** of pentamidine isethionate at a hanging mercury drop electrode
AU Zaroni, M. Valnice B.; Fogg, Arnold G.
CS Chem. Dep., Loughborough Univ. Technol., Loughborough/Leicestershire, LE11 3TU, UK
SO Analyst (Cambridge, United Kingdom) (1993), 118(9), 1163-6
AB Differential-**pulse** cathodic stripping **voltammetry** was used for the **detn.** of trace amts. of pentamidine isethionate at a hanging Hg drop electrode using its redn. peaks at -1.57 V in 0.2 mol L⁻¹ NaOH. The optimum accumulation potential and accumulation time were -1.1 V and up to 180 s, resp. Linear calibration graphs were obtained up to 1 .times. 10⁻⁶ mol L⁻¹: the limit of detection was calcd. to be 3.0 .times. 10⁻¹⁰ mol L⁻¹. The effect of various components of urine on the voltammetric response was studied, and albumin, **creatinine** and uric acid caused interference in the method. The direct detn. of the drug (>1 .times. 10⁻⁷ mol L⁻¹) in urine can be effected using a high diln. of the sample.

L19 ANSWER 119 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 119:61958 CA
TI **Voltammetric analysis** apparatus and method using **multiple working electrodes**
IN Almon, Amy C.
PA USA
SO U.S., 4 pp.
PI US 5217112 A 19930608 US 1991-754841 19910904
PRAI US 1991-754841 19910904
AB An app. and method for electrochem. anal. of elements in soln., comprises an auxiliary electrode, a ref. electrode, and 5 working electrodes, positioned in a container contg. a sample soln. The working electrodes are spaced apart evenly from each other and auxiliary electrode to minimize any inter-electrode interference that may occur during anal. An elec. potential is applied between auxiliary electrode and each of the working electrodes. Simultaneous measurements taken of the current flow through each of the working electrodes for each given potential in a potential range are used for identifying elements present in the sample soln. and their resp. concns. **Multiple working electrodes** enable a more pos. identification to be made by providing unique data characteristic of elements present in the sample soln.

L19 ANSWER 125 OF 167 CA COPYRIGHT 2003 ACS on STN
 AN 115:105089 CA
 TI **Voltammetric** method for simultaneous **determination** of multiple iron salts
 IN Osawa, Hisao; Suzuki, Katsuhide; Yamada, Akifumi
 PA Nippon Filcon Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 5 pp.
 PI JP 02304347 A2 19901218 JP 1989-124155 19890519
 PRAI JP 1989-124155 19890519
 AB A working electrode, a counter electrode, and a ref. electrode are immersed in a sample soln. contg. **multiple** Fe salts, potential of the **working electrode** is varied in the range of -0.3 to +0.9 V vs. Ag/AgCl against that of the counter electrode to obtain oxidn. and redn. wave amplitudes (from voltammogram), and multiple Fe salts in the sample are detd. from a calibration curve prepd. in advance. This detn. is useful for measuring concn. of multiple Fe salts in an etchant used for metal board fabrication.

L19 ANSWER 126 OF 167 CA COPYRIGHT 2003 ACS on STN
 AN 115:21161 CA
 TI Peak resolution in the determination of cobalt and nickel by differential **pulse** and **alternating** current adsorption voltammetry
 AU Locatelli, Clinio; Fagioli, Francesco; Garai, Tibor
 CS Dep. Chem., Univ. Ferrara, Ferrara, I-44100, Italy
 SO Analytical Chemistry (1991), 63(14), 1409-13
 AB The simultaneous detn. of cobalt(II) and nickel(II) by differential **pulse** adsorption voltammetry and fundamental and second harmonic a.c. adsorption voltammetry was compared in the case of very high element concn. ratios. The measurements were carried out in 0.5M ammonia buffer- 1×10^{-4} M dimethylglyoxime (DMG) as the supporting electrolyte, employing a semistationary mercury electrode with a drop time of 180-240 s (the long lasting sessile drop mercury **electrode**) as the **working electrode**. The accuracy of the anal. procedure was checked by the anal. of the std. ref. materials: stainless steel (AISI 321) SRM 121-d and highly alloyed steel (Eurostandard 281-1). The precision, expressed as the relative std. deviation, and the **detection** limits are also reported for each **voltammetric** technique. The selectivity of the above-mentioned three techniques increases in the following order: second harmonic a.c. adsorption voltammetry > differential **pulse** adsorption voltammetry > fundamental harmonic a.c. adsorption voltammetry.

L19 ANSWER 129 OF 167 CA COPYRIGHT 2003 ACS on STN
 AN 113:144600 CA
 TI **Selection** of **potentials** for **pulsed** amperometric detection of carbohydrates at gold electrodes
 AU Andrews, Richard W.; King, Richard M.
 CS Waters Chromatogr. Div., Millipore Corp., Milford, MA, 01757, USA
 SO Analytical Chemistry (1990), 62(19), 2130-4
 AB **Pulsed** amperometric detection of carbohydrates requires that the carbohydrates be oxidized at the detection potential and that the responsivity of the **working electrode** be restored during the cleaning and conditioning **pulses**. Selection of the potentials for detection, cleaning, and conditioning is based on the voltammetric behavior of the Au **working electrode** and the carbohydrates to be detected in the mobile phase used for the sepn. A method for the **selection** of the **pulse potentials** and its application to the detection of a mixt. of monosaccharides are presented.

L19 ANSWER 130 OF 167 CA COPYRIGHT 2003 ACS on STN
 AN 113:70185 CA
 TI Safety in numbers: **detection** with **voltammetric** arrays

9071.56
AU Brearley, T. H.; Doshi, A. K.; Fielden, P. R.
CS Dep. Instrum. Anal. Sci., UMIST, Manchester, M60 1QD, UK
SO Analytical Proceedings (1989), 26(11), 389-90
AB The design and operation are described of a wall-jet flow cell consisting of 1 counter, 1 ref., and a circular array of 8 working electrodes. A microcomputer was used to control and alter the potential of each electrode quickly and independently. Applications described include flow-injection detection of Fe(II) fumarate in a carrier soln. of 0.1m HCL and detection of substituted phenols for reversed-phase HPLC.

L19 ANSWER 131 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 113:59657 CA
TI Anodic voltammetry of model compounds for anticancer drugs
AU Haque, Inam Ul
CS Dep. Chem., Univ. Eng. Technol., Lahore, 54890, Pak.
SO Journal of the Chemical Society of Pakistan (1989), 11(3), 232-6
AB The no. of electrons involved in the electrooxidn. of vindoline, catharanthine and some other model compds. has been detd. by large amplitude pulse voltammetry, LAPV, at carbon paste in wet acetonitrile, and in marginally acidic aq. phosphate buffer.

L19 ANSWER 133 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 112:94870 CA
TI Glucose determination by differential pulse voltammetry with a platinum electrode
AU Temme, J.; Lemke, K.
CS Dep. Tech. Biomed. Cybernet., Ilmenau Inst. Technol., Ilmenau, Ger. Dem. Rep.
SO Biomedica Biochimica Acta (1989), 48(11-12), 883-9
AB Measurements with differential pulse voltammetry were carried out using an electrocatalytic glucose sensor based on a 3-electrode system with a smooth Pt working electrode in a flow-through-type arrangement. The geometric area of the working electrode was 0.5 mm². The influence of environmental conditions (temp., pH, pCO₂, pO₂) was tested using an appropriate parameter set for differential pulse voltammetry (pulse height between -10 and -100 mV, pulse width 40 ms, scan rate 20 mV/s). Also, investigations were conducted in the presence of co-reactants such as urea and some amino acids. Finally, the electrode was tested in human serum. A sequence of anodic and cathodic pulses (duration 1 s; +1150 mV; -950 mV vs. Ag/AgCl) was used as a short rejuvenation cycle (duration 12 s). The signal mostly dependent on glucose was found in the low potential region around -750 mV vs. Ag/AgCl. The calibration curves were nonlinear above a glucose concn. of 12.5 mmol/L. In the linear range, the sensitivity of the electrode was approx. 60 nA/mmol/L for a pulse amplitude of -10 mV; it increased by one order of magnitude at a pulse height of -80 mV. The presence of amino acids caused a decrease of the sensor current to about 35%. Varying their concn. between 50% and 150% of their av. physiol. values was without any influence on the measuring signal. A variation of the urea concn. between 2 and 10 mmol/L had an effect of ~12% of the magnitude of the glucose-dependent sensor current. Linear relations were found between cell current, temp., and pH, resp. The influence of pO₂-changes was partially negligible, and variations in pCO₂ have an influence via pH alteration.

L19 ANSWER 138 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 110:20701 CA
TI Flow-injection methods for the determination of uracil derivatives with voltammetric detection
AU Bouzid, B.; Macdonald, A. M. G.

CS Dep. Chem., Univ. Birmingham, Birmingham, B15 2TT, UK
SO Analytica Chimica Acta (1988), 211(1-2), 175-93
AB Flow-injection methods are described for the detn. of 18 uracil derivs. and related compds., by means of differential-pulse amperometry (DPA) or differential-pulse cathodic stripping voltammetry (DPCSV). The carrier stream is a borax/KNO₃/HNO₃ (or NaOH) soln. contg. 0.001 vol. % Triton X 100. This surfactant displaces the oxygen redn. peak to such neg. potentials that deaeration is unnecessary for detection of compds. having peak potentials in the range 180-70 mV (vs. Ag/AgCl) at pH 7.6. At the hanging mercury drop electrode, the uracil deriv. is deposited from the flowing sample at a fixed potential more pos. than the relevant peak potential and stripped under stopped-flow or slow-flow conditions. In the amperometric mode, a const. potential also more pos. than the relevant peak potential is applied to the dropping mercury electrode and the resulting peak is measured under flow conditions. Linear calibration graphs were found for most of the compds. at 10⁻⁷-10⁻⁶ M by DPA and about one order of magnitude lower by DPCSV. The limit of detn. for 5-iodouracil was 5 × 10⁻⁹ M (~1.2 ng/mL). Sepn. is needed for applications to blood or urine. Samples deproteination followed by high-performance liq. chromatog. with a reversed-phase column proved satisfactory. Sepns. of various uracil derivs., and of 5-fluorouracil, uric acid and 5-fluorodeoxyuridine, are described; spectrophotometric and amperometric detectors were used sequentially to check performance.

L19 ANSWER 144 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 106:27170 CA
TI **Analysis** of chemical carcinogens. IV. **Polarographic and voltammetric determination** of 4-(dimethylamino)azobenzene
AU Barek, Jiri; Hrnecir, Roman
CS Dep. Anal. Chem., Charles Univ., Prague, 128 40/2, Czech.
SO Collection of Czechoslovak Chemical Communications (1986), 51(10), 2083-90
AB Conditions were found for the detn. of the chem. carcinogen 4-(dimethylamino)azobenzene by TAST and differential-pulse polarog., fast-scan differential-pulse voltammetry, and linear-sweep voltammetry at a hanging Hg drop electrode in a mixed aq.-methanolic medium. The detection limit of the last 2 methods, approx. 10⁻⁸ mol L⁻¹, can be further lowered by preliminary accumulation of the substance to be detd. by adsorption at a **working electrode**. The applicability of these methods to the anal. of biol. materials, directly or combined with an extn., was demonstrated.

L19 ANSWER 149 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 101:166618 CA
TI Determination of trace elements in plant material by anodic stripping and peak **alternating** current voltammetry. Critical comparison with atomic absorption spectroscopy
AU Locatelli, Clinio; Fagioli, Francesco; Bighi, Corrado; Landi, Silvio; Garai, Tibor
CS Univ. Ferrara, Ferrara, 44100, Italy
SO Annali di Chimica (Rome, Italy) (1984), 74(7-8), 521-35
AB Metals were detd. in plant materials (Std. ref. material 1571 Orchard Leaves of the National Bureau of Stds.) at trace levels by employing either a.c. anodic stripping voltammetry (ACASV) (Zn, Cd, Pb, and Cu) or a.c. voltammetry (ACV) (Fe and Mn) with a semistationary Hg electrode. The **working electrode** was a long-lasting sessile-drop Hg electrode (LLSDME). The influence of electrolysis time, stirring rate, **pulse** amplitude, frequency, and scan rate on the peak currents is reported. The samples were dry-ashed and then dissolved in HClO₄. For each element, anal. measurements were carried out by the std. addns. method. The results showed good

agreement between the concn. certified for each element by the National Bureau of Stds. and the concn. detd. by the proposed method. A crit. comparison with at. absorption spectroscopy (AAS) is also reported.

- L19 ANSWER 150 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 100:155310 CA
TI Determination of **trace** amounts of heavy metals in foods by anodic stripping voltammetry. Optimization of apparatus parameters
AU Aliakbar, Alireza; Popl, Milan
CS Dep. Anal. Chem., Prague Inst. Chem. Technol., Prague, 166 28/6, Czech.
SO Collection of Czechoslovak Chemical Communications (1984), 49(1), 45-50
AB The use of differential **pulse** anodic stripping **voltammetry** in the **detn.** of heavy metals (Cd, Pb, Cu, As) in foods was studied. Preconcg. from solns. and dissoln. took place on a thin-film Hg electrode. A factorial expt. served to det. the effects of variable parameters of the **polarog. analyzer: pulse** amplitude, **pulse** period, and potential scan of the **working electrode** during dissoln. The 1st 2 parameters are significant but the scan rate is not. The app. parameters were optimized further by the method of response surface fitting near optimum.
- L19 ANSWER 154 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 95:164894 CA
TI Computer-controlled coulometric stripping analysis
AU Schreiber, Mark A.; Last, Thomas A.
CS Dep. Chem., Univ. Virginia, Charlottesville, VA, 22901, USA
SO Analytical Chemistry (1981), 53(13), 2095-100
AB A computer-controlled coulostat was developed and used for anal. of solns. contg. **trace** quantities of heavy metals. The coulometric method eliminates the problem of uncompensated soln. resistance and corrects for the double layer charging error. The instrument can implement many different types of electrochem. control simply by changing the way in which precise charge **pulses** are added to the **working electrode**. Further, switching from one mode to another requires only software changes. The chronopotentiometric and linear sweep anodic stripping modes were demonstrated. The instrument exhibited 5% precision at 1 ppb Cd when operated in the linear-sweep anodic-stripping mode with a thin film Hg/wax-impregnated graphite electrode. This corresponds to a detection limit of 100 parts/trillion. By summation of data from multiple stripping scans, still greater sensitivity can be achieved. **Urine** samples were analyzed, and detectable amts. of Pb and Cu were found.
- L19 ANSWER 156 OF 167 CA COPYRIGHT 2003 ACS on STN
AN 94:108975 CA
TI Application of an autoranging amplifier in the simultaneous determination of **trace** heavy metals by anodic stripping voltammetry
AU Ben-Yaakov, Sam; Lazar, Boaz
CS Dep. Electr. Eng., Ben-Gurion Univ. Negev, Beer-Sheva, Israel
SO Talanta (1980), 27(12), 1061-6
AB An autoranging amplifier with a gain of 1-1000 was used in the differential-**pulse** anodic stripping **voltammetric detn.** of heavy metals in stored sea water, in the subtractive mode with 2 **working electrodes**. Time was saved by eliminating the need for trial runs for gain adjustments and no change was necessary in the recorder scale during the anal.

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